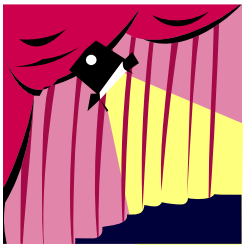

OUTBREAK SPOTLIGHT....

"Outbreak Spotlight" is a regularly appearing feature in the *Indiana Epidemiology Newsletter* to illustrate the importance of various aspects of outbreak investigation. The event described below illustrates how careful monitoring of disease reports can identify outbreaks that might otherwise be undetected.

An Inapparent Outbreak of Salmonellosis in Perry County

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Background

On July 13, 2005, the public health nurse from the Perry County Health Department (PCHD) notified the Indiana State Department of Health (ISDH) of two cases of laboratory confirmed *Salmonella* cases. Two other confirmed cases had also been received earlier in the month, and these cases reported working at the same medical clinic. There was no apparent relationship between the latter two cases or ties between the two pairs of reports. The onset dates were June 11, June 12, and July 3 (two cases). Two cases had been hospitalized. Due to the incubation period of *Salmonella* (6-72 hours), the initial two case reports could not have transmitted infection to the second two cases.

Epidemiologic Investigation

The PCHD and the ISDH initiated a collaborative investigation. The local public health nurse conducted interviews with each of the four cases. Based on the food histories given, all four had consumed food prepared at Restaurant X in Tell City. The two clinic coworkers had eaten a catered lunch on June 8 provided by a drug company representative. That lunch was prepared and delivered by Restaurant X. The July cases indicated that each had eaten their evening meal at Restaurant X on July 1. The PCHD obtained a list of the menu items from the catered lunch on June 8. The ISDH developed a questionnaire to determine if the illness was food-related and if the catered lunch was possibly a common source. The public health nurse and the District 10 ISDH field epidemiologist conducted interviews with the clinic staff members who ate the catered lunch. A case was defined as a previously healthy person who ate the catered lunch and developed diarrhea or vomiting on or after June 8.

Ten clinic staff members reported having eaten the catered lunch, and eight stated that they became ill following the meal. Predominant symptoms reported included diarrhea (100%), cramps (75%), and nausea (62.5%). Other symptoms reported were headache, body aches, and fever. Two cases sought medical attention and submitted stool specimens to a local hospital laboratory for testing (see Laboratory Results).

Environmental Assessment

The environmental health specialist from the PCHD conducted an inspection of the restaurant on July 18. Two critical violations were noted: 1) improper storage of a food item beneath the prep table and 2) the use of plastic cups to dispense condiments. Corrective measures were discussed, and violations were corrected that day. No food handlers had reported any recent diarrheal illness.

Laboratory Results

The four identified cases submitted stool specimens at Perry County Memorial Hospital. The hospital laboratory forwarded them to a reference laboratory in Louisville, Kentucky. The stool specimens tested positive for *Salmonella*, and the isolates were forwarded to the Division of Laboratory Services at the Kentucky Department for Public Health for serotyping and pulse-field gel electrophoreses (PFGE) testing. Results were forwarded to the District 10 ISDH field epidemiologist. All four isolates were subtyped as *Salmonella enteritidis.* All four exhibited indistinguishable band patterns by PFGE analysis.

No food samples were available for testing.

Conclusions

The investigation confirmed that an outbreak of gastroenteritis occurred in Perry County between June 8 and July 3. The causative agent was *Salmonella enteritidis.* Four cases were laboratory confirmed, and all exhibited a common PFGE pattern, possibly indicating a common source.

Salmonella enteritidis is a bacterium commonly found in poultry, eggs, swine, and cattle. Infection can occur after eating undercooked foods of animal origin or ready-to-eat foods contaminated with *Salmonella* bacteria through cross-contamination of food preparation surfaces or equipment. *Salmonella* bacteria are also shed in the stool of infected persons, and infection can also be transmitted person to person through contaminated hands or surfaces.

The specific source of this outbreak was not identified. Although all cases reported having eaten food from Restaurant X within the given time frame, no common food item was identified between the two cases with onsets in July, and no common items were identified between these cases and the cases from the catered lunch. No particular food item from the catered lunch or the meals eaten by the cases in July from Restaurant X was identified as a vehicle. No food samples were available for testing. No food handlers were reported ill, and no critical violations relating to this outbreak were noted during the restaurant inspection. Statistical analysis was limited due to the small number of questionnaires obtained. The epidemic curve (Figure 1), which depicts onset dates of cases having consumed the catered lunch, is representative of a continuous source rather than a common source. The intermittent onset dates indicate that transmission among clinic workers was primarily person to person. If the catered meal was the source, the onset dates would have fallen into a very narrow range. Since those who ate the catered meal also shared a common workplace, it is possible that the initial infected person could have consumed contaminated food, but subsequent transmission was due to contact within the work environment.

All four laboratory-confirmed cases showed identical PFGE band patterns. Typically, identical PFGE band patterns can indicate a common source of exposure. However, since *S. enteritidis* is extremely common, even cases having identical band patterns may not necessarily be related to the same source.

In general, most foodborne outbreaks of *Salmonella* can be avoided by strictly adhering to the following practices:

1. Thoroughly wash hands with soap and water before, during, and after food preparation.
2. Educate employees about proper hand washing after using the restroom.
3. Exclude employees from working while ill with diarrhea and/or vomiting until symptoms have ceased.
4. Thoroughly cook all food items derived from animal sources, particularly poultry, pork, egg products, and meat dishes.
5. Use separate utensils, equipment, and preparation surfaces for raw meats and eggs and ready-to-eat foods such as lettuce and vegetables.
6. Use pasteurized or irradiated egg products to prepare dishes in which eggs would otherwise be pooled before cooking or when the food item containing eggs is not subsequently cooked.
7. Store foods at proper refrigeration and holding temperatures.

Addendum

On September 13, the PCHD contacted the ISDH regarding another confirmed *Salmonella* case who reported eating at Restaurant X. Later laboratory results identified the cause as *Salmonella enteritidis.* No further reports were received. The PCHD and the ISDH collaborated again to determine if the local restaurant was the source of these illnesses. The PCHD environmental health specialist and a field representative from the ISDH Food Protection Program visited Restaurant X on September 22 to conduct a Hazard Analysis Critical Control Point (HACCP) inspection, a process designed to monitor and evaluate food preparation and to identify and eliminate potential food safety problems. No practices were attributable to potential *Salmonella* contamination. The environmental health specialist requested the voluntary submission of stool specimens from the four food handlers at the restaurant. All four tested negative for *Salmonella.*

Figure 1.